

Name \_\_\_\_\_

## Compare Fraction Factors and Products

**Essential Question** How does the size of the product compare to the size of one factor when multiplying fractions?

COMMON CORE STANDARDS CC.5.NF.5a, CC.5.NF.5b

Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

### UNLOCK the Problem REAL WORLD

Multiplication can be thought of as resizing one number by another number. For example,  $2 \times 3$  will result in a product that is 2 times as great as 3.

What happens to the size of a product when a number is multiplied by a fraction rather than a whole number?

### One Way Use a model.



**A** During the week, the Smith family ate  $\frac{3}{4}$  of a box of cereal.

- Shade the model to show  $\frac{3}{4}$  of a box of cereal.
- Write an expression for  $\frac{3}{4}$  of 1 box of cereal.  $\frac{3}{4} \times$
- Will the product be *equal to*, *greater than*, or *less than* 1?


**B** The Ling family has 4 boxes of cereal. They ate  $\frac{3}{4}$  of all the cereal during the week.

- Shade the model to show  $\frac{3}{4}$  of 4 boxes of cereal.
- Write an expression for  $\frac{3}{4}$  of 4 boxes of cereal.  $\frac{3}{4} \times$
- Will the product be *equal to*, *greater than*, or *less than* 4?


**C** The Carter family has only  $\frac{1}{2}$  of a box of cereal at the beginning of the week. They ate  $\frac{3}{4}$  of the  $\frac{1}{2}$  box of cereal.

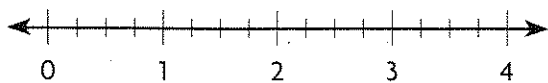
- Shade the model to show  $\frac{3}{4}$  of  $\frac{1}{2}$  box of cereal.
- Write an expression to show  $\frac{3}{4}$  of  $\frac{1}{2}$  box of cereal.  $\frac{3}{4} \times$
- Will the product be *equal to*, *greater than*, or *less than*  $\frac{1}{2}$ ? *than*  $\frac{3}{4}$ ?


## Another Way Use a diagram.

You can use a diagram to show the relationship between the products when a fraction is multiplied or scaled (resized) by a number.

Graph a point to show  $\frac{3}{4}$  scaled by 1,  $\frac{1}{2}$ , and 4.

**A**  $1 \times \frac{3}{4}$



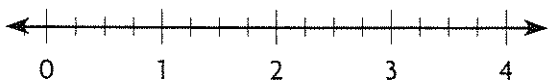
Think: Locate  $\frac{3}{4}$  on the diagram and shade that distance from 0. Then graph a point to show 1 of  $\frac{3}{4}$ .

**B**  $\frac{1}{2} \times \frac{3}{4}$



Think: Locate  $\frac{3}{4}$  on the diagram and shade that distance from 0. Then graph a point to show  $\frac{1}{2}$  of  $\frac{3}{4}$ .

**C**  $4 \times \frac{3}{4}$



Think: Locate  $\frac{3}{4}$  on the diagram and shade that distance from 0. Then graph a point to show 4 times  $\frac{3}{4}$ .

Complete each statement with *equal to*, *greater than*, or *less than*.

- The product of 1 and  $\frac{3}{4}$  will be  $\frac{3}{4}$ .
- The product of a number less than 1 and  $\frac{3}{4}$  will be  $\frac{3}{4}$  and \_\_\_\_\_ the other factor.
- The product of a number greater than 1 and  $\frac{3}{4}$  will be  $\frac{3}{4}$  and \_\_\_\_\_ the other factor.

### Math Talk

#### MATHEMATICAL PRACTICES

What if  $\frac{3}{5}$  was multiplied by  $\frac{1}{6}$  or by the whole number 7? Would the products be equal to, greater than, or less than  $\frac{3}{5}$ ? Explain.

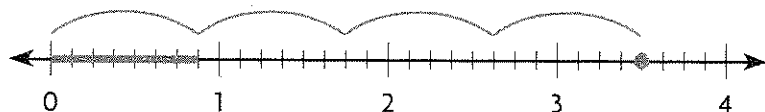
Name \_\_\_\_\_

## Share and Show



Complete the statement with *equal to*, *greater than*, or *less than*.

1.  $4 \times \frac{7}{8}$  will be \_\_\_\_\_  $\frac{7}{8}$ .



2.  $\frac{3}{5} \times \frac{2}{7}$  will be \_\_\_\_\_  $\frac{3}{5}$ .

3.  $\frac{5}{8} \times 6$  will be \_\_\_\_\_  $\frac{5}{8}$ .

4.  $\frac{2}{3} \times \frac{5}{5}$  will be \_\_\_\_\_  $\frac{2}{3}$ .

5.  $8 \times \frac{7}{8}$  will be \_\_\_\_\_ 8.

## On Your Own

Complete the statement with *equal to*, *greater than*, or *less than*.

6.  $\frac{4}{9} \times \frac{3}{8}$  will be \_\_\_\_\_  $\frac{3}{8}$ .

7.  $7 \times \frac{9}{10}$  will be \_\_\_\_\_  $\frac{9}{10}$ .

8.  $5 \times \frac{1}{3}$  will be \_\_\_\_\_  $\frac{1}{3}$ .

9.  $\frac{6}{11} \times 1$  will be \_\_\_\_\_  $\frac{6}{11}$ .

10.  $\frac{1}{6} \times \frac{7}{7}$  will be \_\_\_\_\_ 1.

11.  $4 \times \frac{3}{5}$  will be \_\_\_\_\_  $\frac{3}{5}$ .